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(54) **SIM CARD CONNECTOR WITH LOCKING ARRANGEMENT**

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(51) **Int. Cl.**
H01R 24/00 (2006.01)

(52) **U.S. Cl.** **439/630**

(58) **Field of Classification Search** 439/630
See application file for complete search history.

(56) **References Cited**

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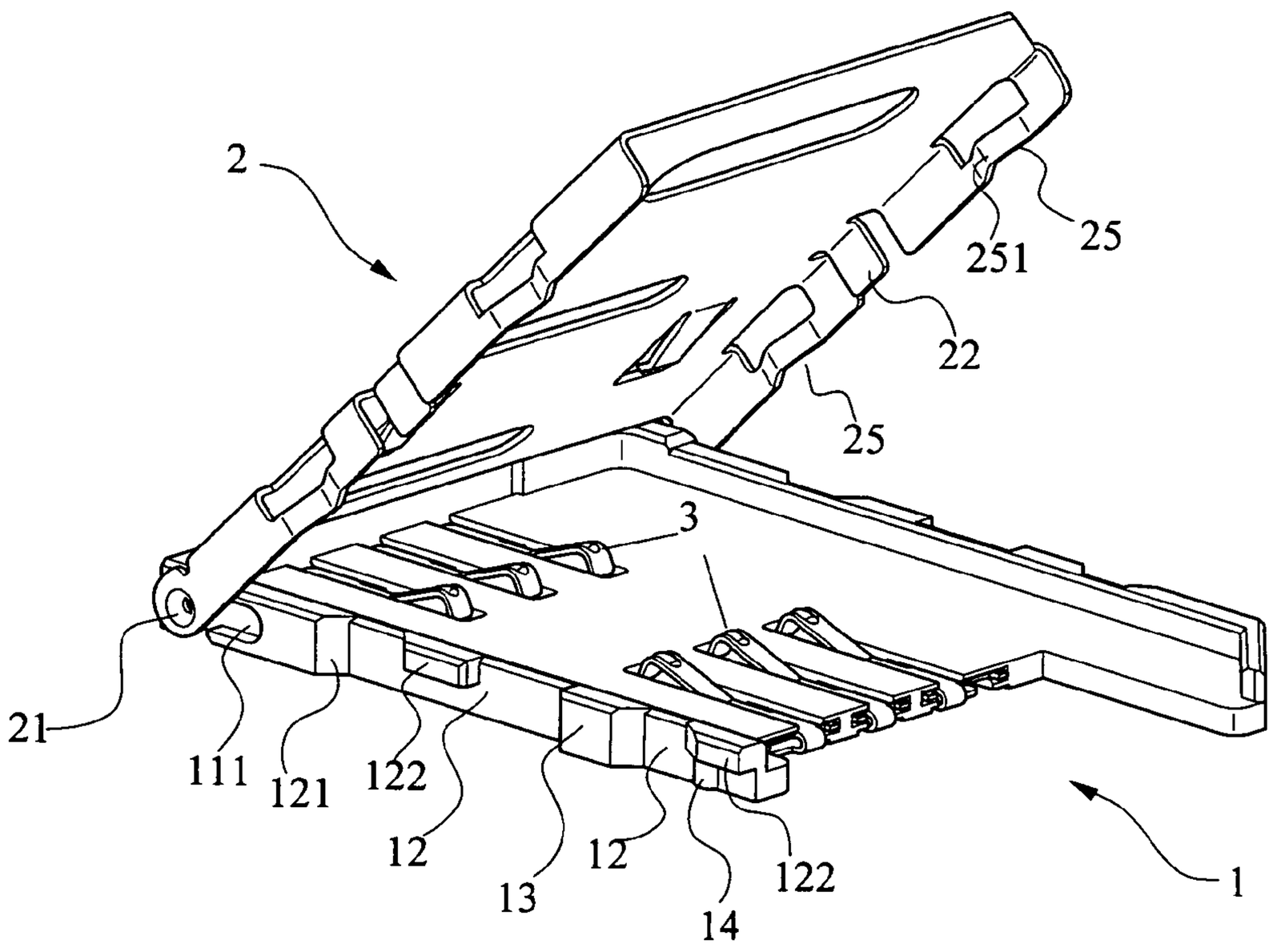
(57) **ABSTRACT**

A SIM card connector includes an insulative base including on its either side an L-shaped rear groove, a recess including a rear ramp, an intermediate protrusion, a tab between the rear ramp and the protrusion, and a front protuberance, and a front stop member; a cover including two side flanges each including a rear pin slidably fitted in and confined by the groove to form a pivot, rear and front gables, and an intermediate tongue; and conductors on a bottom of the base. Sliding the cover forward will interlock the cover and the base by moving either pin to a forward end of the groove with either rear fastening member being urged against the protuberance, either tongue being stopped by the protrusion, and either front fastening member being securely engaged with both the stop member and protuberance after passing the stop member.

3 Claims, 5 Drawing Sheets



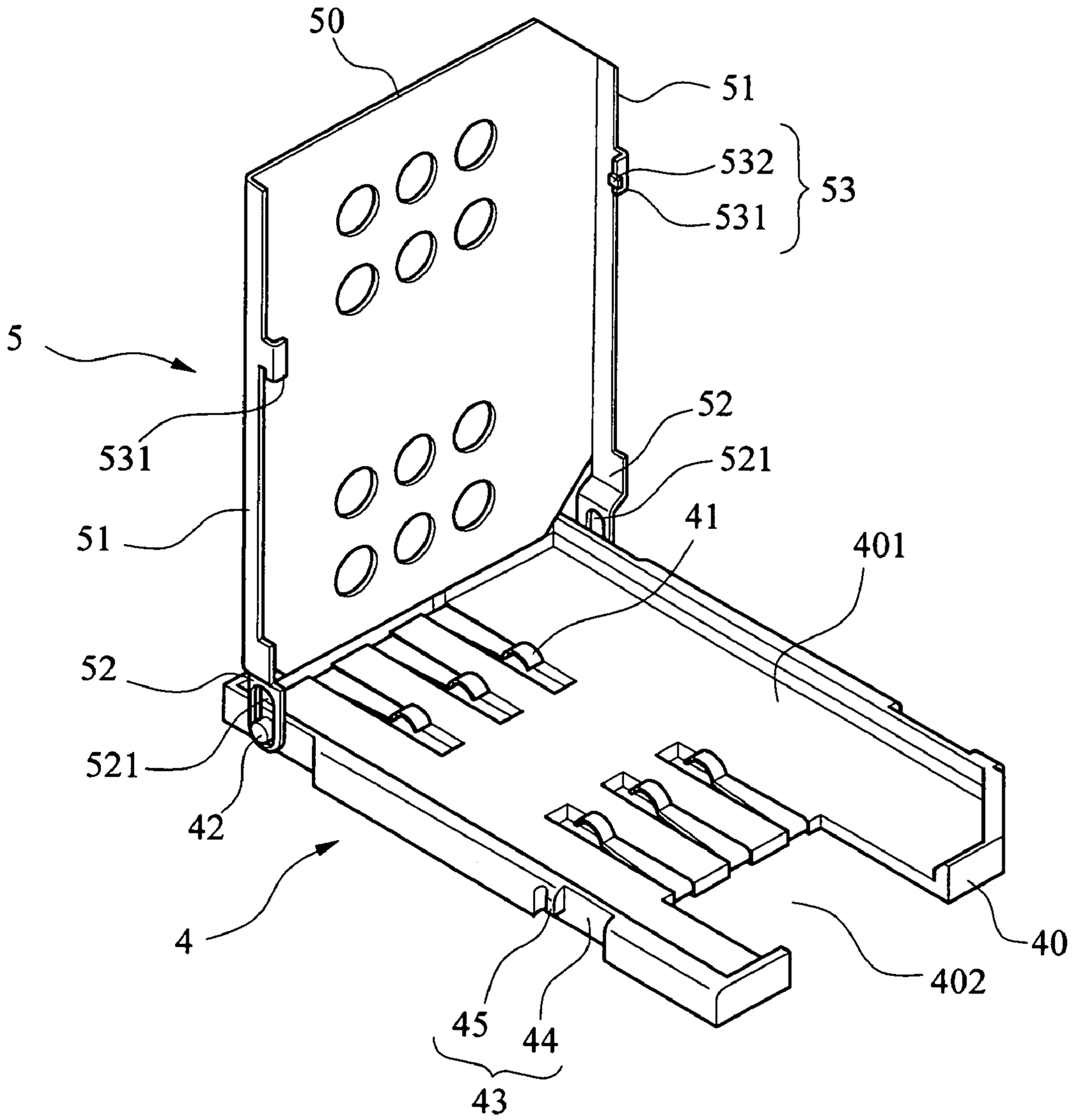


FIG. 1(PRIOR ART)

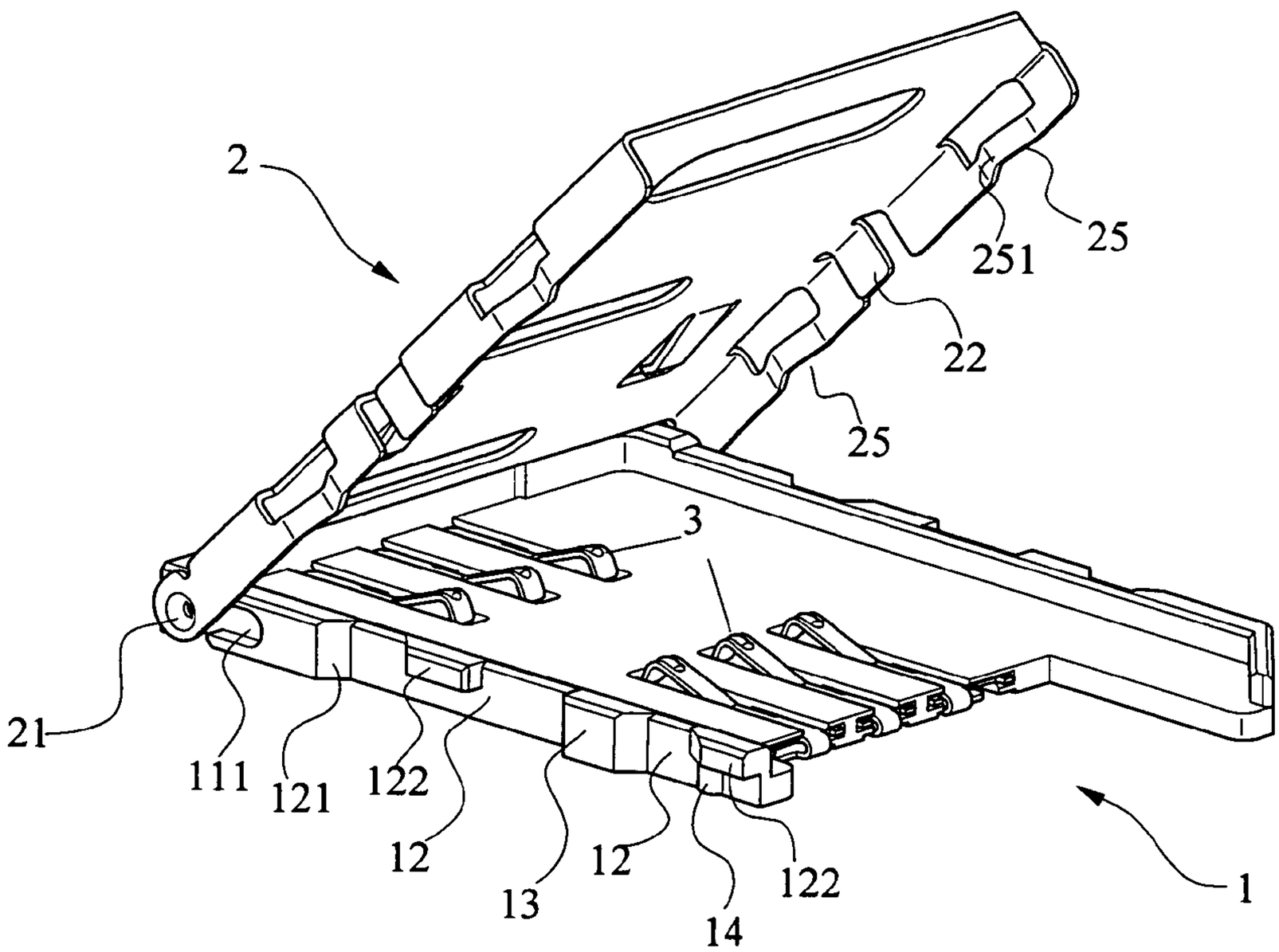


FIG. 2

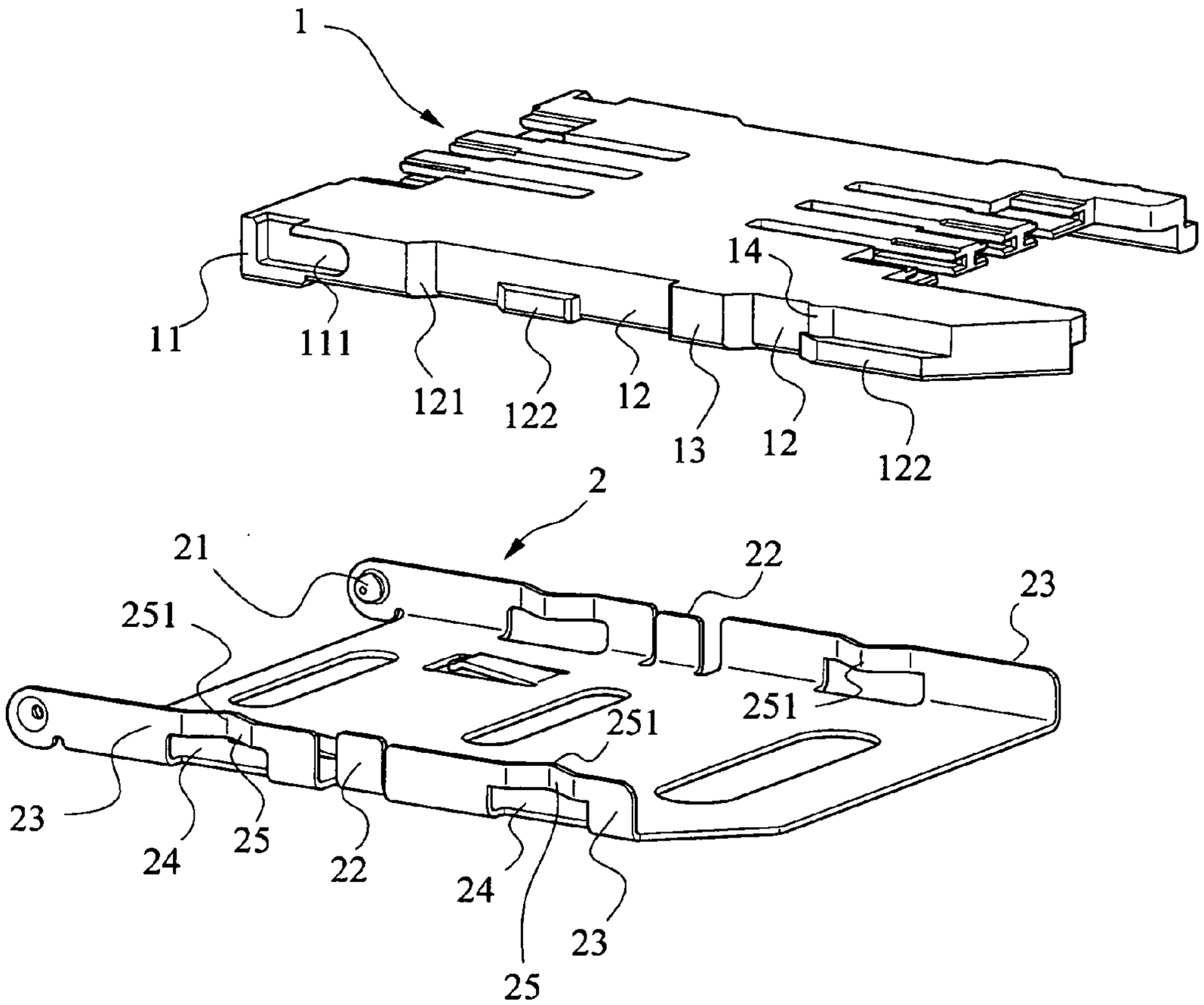

1
11
111
121
122
12
13
14
12
122
2
21
251
22
23
251
251
23
24
25
22
24
23

FIG. 3

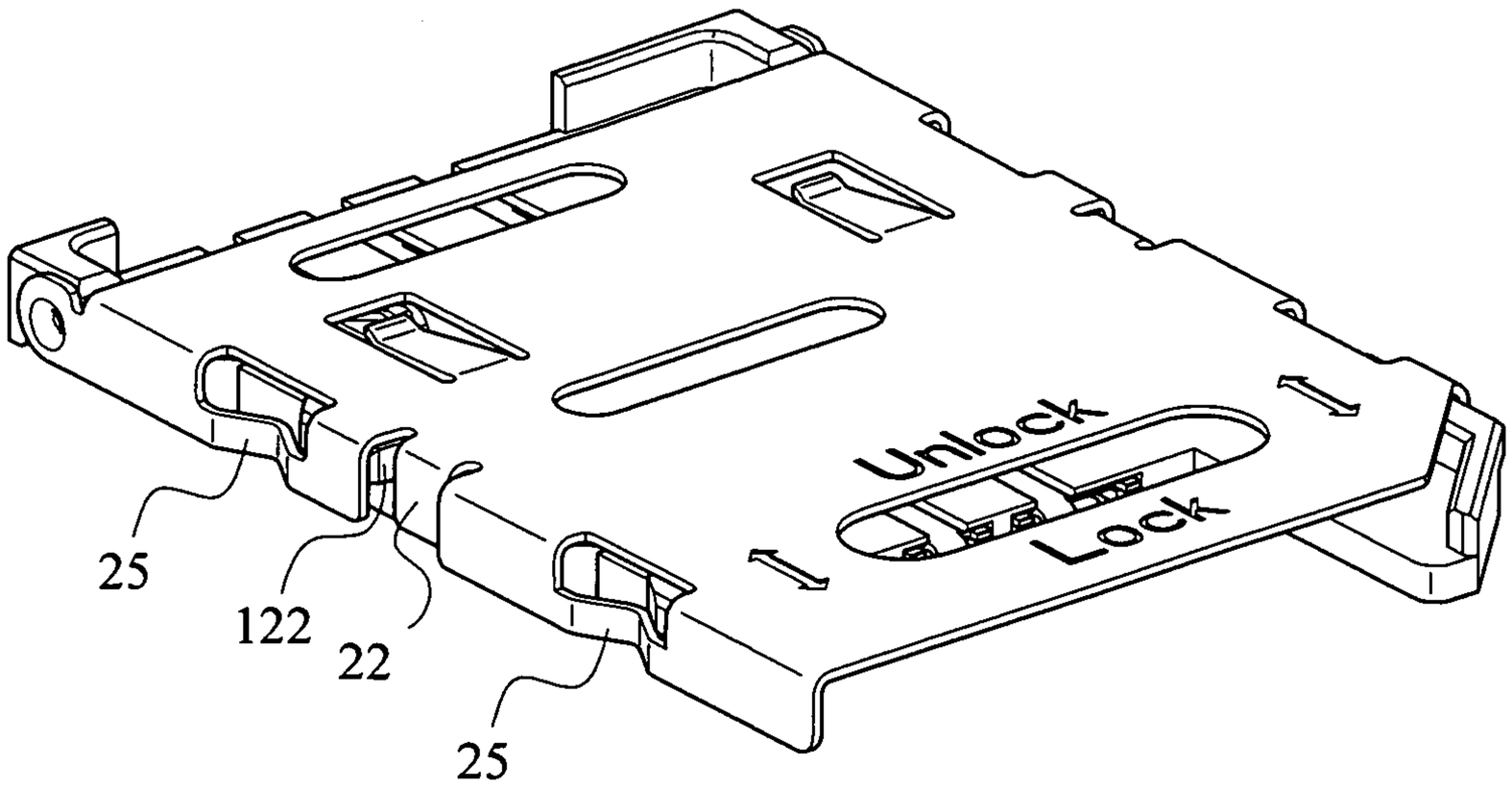


FIG. 4

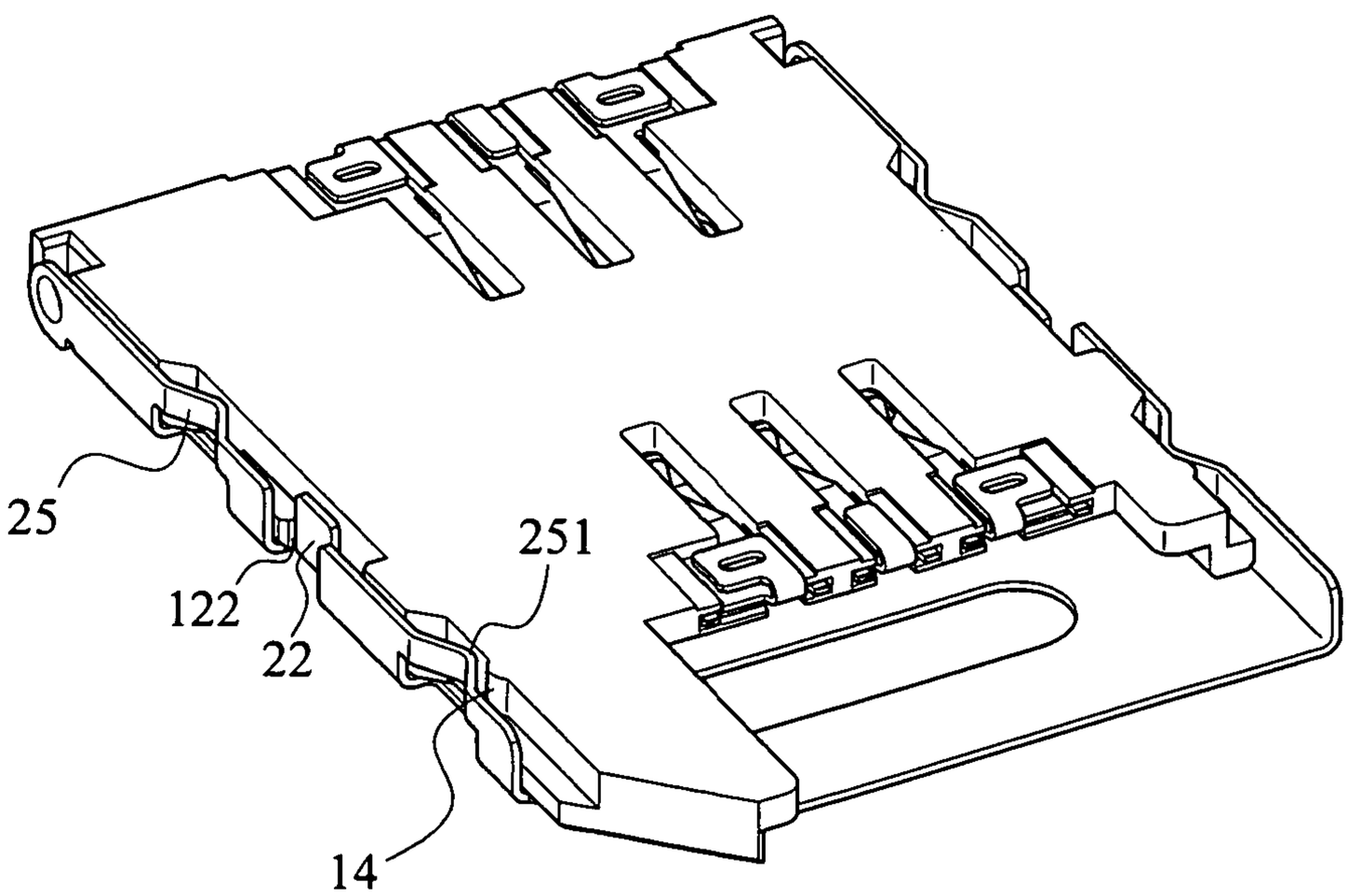


FIG. 5

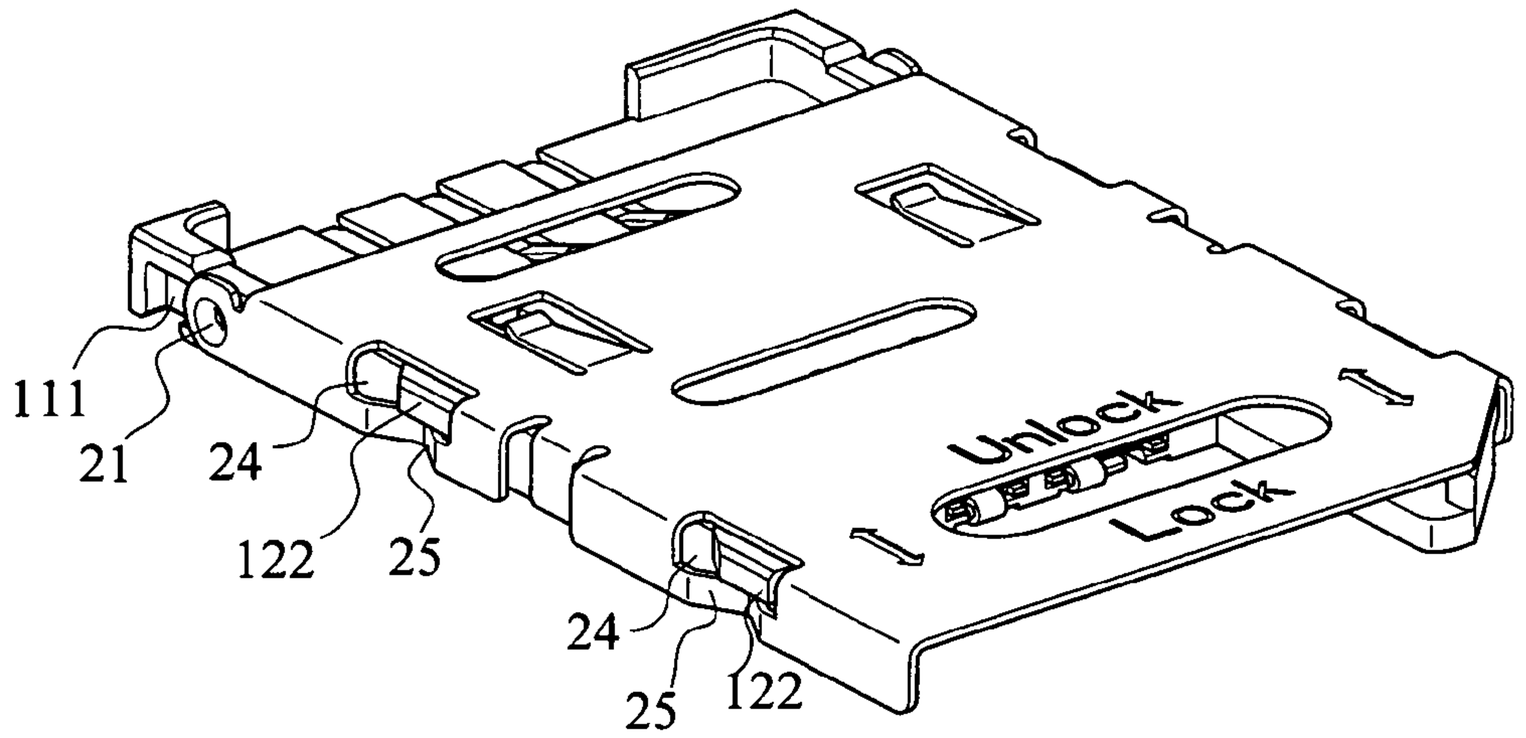


FIG. 6

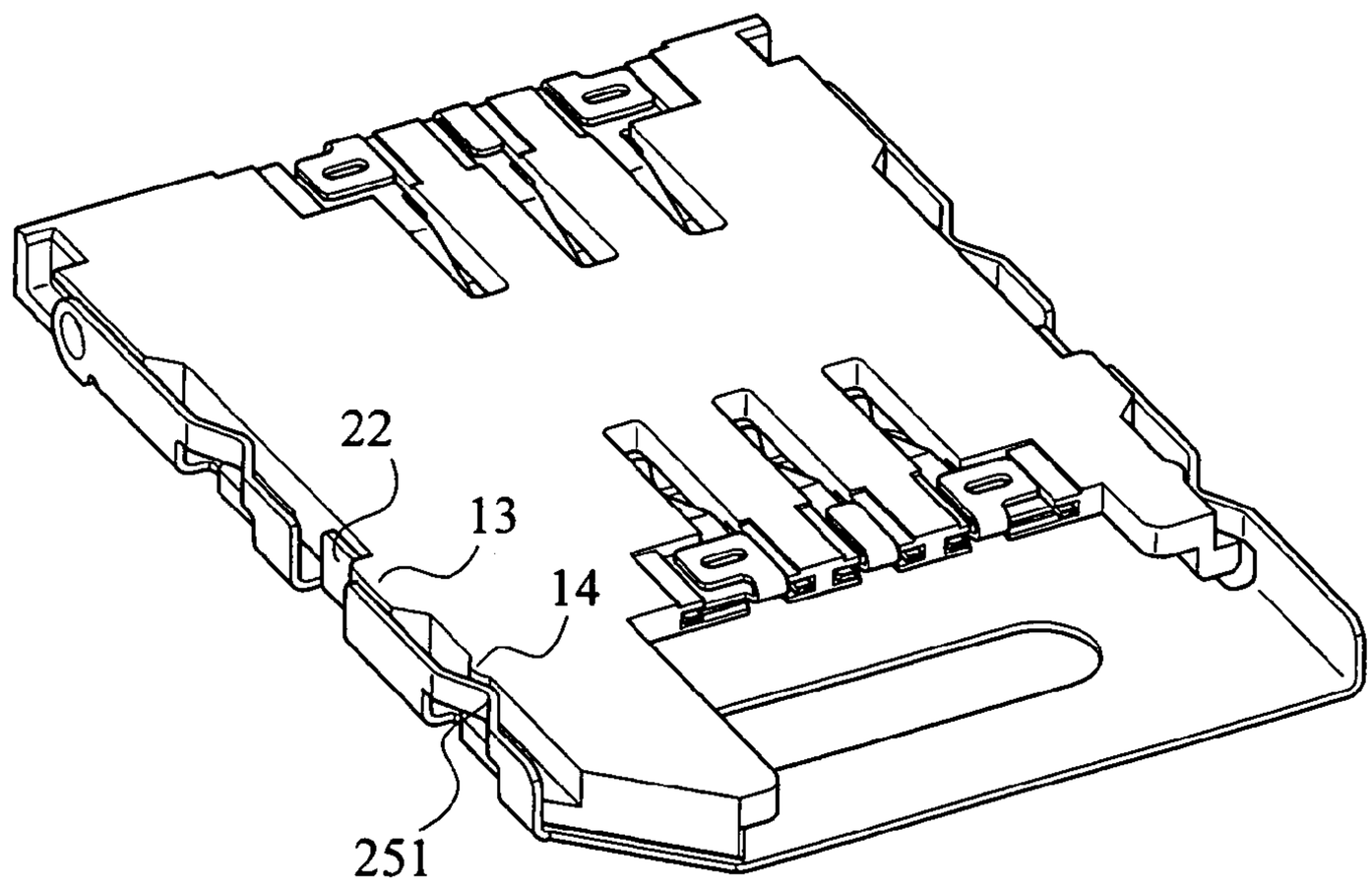


FIG. 7

SIM CARD CONNECTOR WITH LOCKING ARRANGEMENT

BACKGROUND OF THE INVENTION

1. Field of Invention

The present invention relates to SIM (Subscriber Identity Module) card connectors, and more particularly to such a SIM card connector having an improved locking arrangement.

2. Description of Related Art

Technology, particularly mobile communication technology, has known a rapid, spectacular development in recent years. For mobile phones, its trend is compact, aesthetic, and multi-functional. In this regard, components (e.g., SIM card connectors) for mobile phone are also required to improve.

A conventional SIM card connector in its open condition is shown in FIG. **1**. The substantially rectangular SIM card connector comprises an insulative base **4**, a cover **5**, and a plurality of parallel conductors **41** on a bottom of the base **4**. The base **4** comprises two opposite, cylindrical arms **42** on both sides proximate two rear corners, two opposite snap fastening members **43** on both sides proximate two front corners, the snap fastening member **43** including a cavity **44** and a tab **45**, two front edge sections **40**, and a rectangular recess **402** formed between the front edge sections **40**.

The cover **5** comprises a body **50**, two pivots **52** at two rear corners of the body **50**, the pivot **52** including an elongate opening **521** snugly fitted around the arms **42** to form a hinge, two side flanges **51**, and two opposite, mating snap fastening members **53** on both sides proximate two front corners, the mating snap fastening member **53** including a latch **531** and a hook **532**.

A user may close the cover **5** onto the base **4** by pivoting the cover **5** about the pivots **52**. As a result, the latches **531** are fitted in the cavities **44** and the hooks **532** are matingly engaged with the tabs **45**.

But this locking design is unsatisfactory for the purpose for which the invention is concerned for the following reasons: An accidental back or forth movement of the cover **5** may unlock the SIM card connector because there is no stopping mechanism. Further, the locking engagement of the snap fastening members **43** and **53** is not reliable. In fact, it is relatively loose. Thus, the need for improvement still exists.

SUMMARY OF THE INVENTION

It is therefore one object of the present invention to provide a SIM card connector having a locking arrangement comprising a base including on its either side a recess extended from an intermediate portion to a front end, an intermediate protrusion, and a tab between a rear end of the recess and the protrusion; and a cover including on its either side rear and front inward gables and an intermediate tongue wherein the gables and the tongue on either side of the cover are adapted to secure to the corresponding protrusion and tab on either side of the base by sliding the cover forward in its closed, locked condition.

It is another object of the present invention to provide a SIM card connector having a locking arrangement wherein the base further comprises a rear stop member on either side such that either front gable is securely engaged with the stop member after passing the stop member in its closed, locked condition. Thus, even a strong vibration of the SIM card connector will not compromise the locking arrangement.

To achieve the above and other objects, the present invention provides a SIM card connector of substantially rectangular, comprising an insulative base including on its either side an L-shaped groove on a rear corner, a recess extended from an intermediate portion to a front end and including a rear ramp, an intermediate protrusion, a tab between the rear ramp and the protrusion, and a front protuberance, and a stop member extended from a rear end of the protuberance and disposed perpendicular to the protuberance; a cover including two side flanges each including a pin on a rear corner slidably fitted in and confined by the groove to form a pivot, rear and front openings, rear and front fastening members each being parallel with the adjacent opening, and an intermediate tongue; and a plurality of parallel conductors on a bottom of the base; whereby pivoting the cover about the pins to cover the base will cause either rear fastening member to urge against a portion of the recess between the rear ramp and the protuberance, either tongue to fit between the tab and the protrusion, and either front fastening member to urge against a portion of the recess between the protrusion and both the stop member and protuberance; and whereby sliding the cover forward will interlock the cover and the base by moving either pin forward from a bending point of the groove until being stopped by a forward end of the groove with either rear fastening member being urged against the protuberance, either tongue being stopped by the protrusion, and either front fastening member being securely engaged with both the stop member and protuberance after passing the stop member.

In one aspect of the present invention the fastening member is a gable.

The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a conventional SIM card connector in its open condition;

FIG. **2** is a perspective view of a preferred embodiment of SIM card connector according to the invention in its open condition;

FIG. **3** is an exploded perspective view of the SIM card connector of FIG. **2**;

FIG. **4** is a perspective view of the SIM card connector of FIG. **2** in its closed, unlocked condition;

FIG. **5** is a view of the SIM card connector of FIG. **4** from an opposite perspective;

FIG. **6** is a perspective view of the SIM card connector of FIG. **2** in its closed, locked condition; and

FIG. **7** is a view of the SIM card connector of FIG. **6** from an opposite perspective.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. **2** to **7**, a SIM card connector in accordance with a preferred embodiment of the invention is shown. The substantially rectangular SIM card connector comprises an insulative base **1**, a cover **2**, and a plurality of parallel conductors **3** on a bottom of the base **1**. Each component is discussed in detailed below.

The base **1** comprises a front cut terminated at the conductors **3**. On either side of the base **1** there are provided an L-shaped projection **11** on a rear corner, the projection **11**

including an abutted L-shaped groove **111**, a recess **12** extended from an intermediate portion to a front end and including a rear ramp **121**, an intermediate protrusion **13**, a tab **122** between the rear ramp **121** and the protrusion **13**, and a front protuberance **122**, and a stop member **14** extended from a rear end of the protuberance **122** and disposed perpendicular to the protuberance **122**.

The cover **2** is of inverted U-section and comprises a plurality of openings (not labeled) on its main portion. On either side **23** of the cover **2** there are provided a half-spherical pin **21** on a rear corner, rear and front openings **24**, rear and front inward flexible gables **25** each being parallel with the adjacent opening **24**, the gable **25** including an apex **251**, and an intermediate tongue **22**.

In an assembled state of the SIM card connector (see FIGS. **4** and **5**), either pin **21** is slidably fitted in and confined by the groove **111**, either rear gable **25** is urged against a portion of the recess **12** between the rear ramp **121** and the protuberance **122**, either tongue **22** is fitted between the tab **122** and the protrusion **13**, and either front gable **25** is urged against a portion of the recess **12** between the protrusion **13** and both the stop member **14** and protuberance **122**. Further, the conductors **3** are fitted in respective openings on the main portion of the cover **2**. This is also a closed, unlocked condition of the SIM card connector.

For locking the SIM card connector (see FIGS. **6** and **7**), a user may slide the cover **2** forward to cause either pin **21** to move forward from a bending point of the groove **111** until being stopped by a forward end of the groove **111**. In this closed, locked condition of the SIM card connector, either rear gable **25** is urged against the protuberance **122**, either tongue **22** is urged against and stopped by the protrusion **13**, and either front gable **25** is securely engaged with both the stop member **14** and protuberance **122** after passing the stop member **14**.

It is understood that the only way to open the locked SIM card connector is to slide the cover **2** rearward until being stopped by the bending point of the groove **111** and then pivot the cover **2** (or the base **1**) about the pins **21**. Thus, the invention can prevent the SIM card connector from being unlocked and opened by an accidental movement of the cover **2**.

While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A SIM (Subscriber Identity Module) card connector of substantially rectangular, comprising:

an insulative base **1** on an either side thereof including an L-shaped groove **111** on a rear corner, a recess **12** extended from an intermediate portion to a front end and having a rear shoulder **121**, an intermediate protrusion **13**, a tab **122** between the rear shoulder **121** and the protrusion **13**, and a front protuberance **122**, and a stop member **14** extended from a rear end of the protuberance **122** and disposed perpendicular to the protuberance **122**;

a cover **2** including two side flanges **23** each including a pin **21** on a rear corner slidably fitted in and confined by the groove **111** to form a pivot, a rear and a front openings **24**, a rear and a front flexible fastening members **25** each being parallel with the adjacent opening **24**, and an intermediate tongue **22**; and

a plurality of parallel conductors **3** on a bottom of the base **1**;

whereby pivoting the cover **2** about the pins **21** to cover the base **1** will cause either rear fastening member **25** to urge against a portion of the recess **12** between the rear shoulder **121** and the protuberance **122**, either tongue **22** to fit between the tab **122** and the protrusion **13**, and either front fastening member **25** to urge against a portion of the recess **12** between the protrusion **13** and both the stop member **14** and protuberance **122**; and

whereby sliding the cover **2** forward will interlock the cover **2** and the base **1** by moving either pin **21** forward from a bending point of the groove **111** until being stopped by a forward end of the groove **111** with either rear fastening member **25** being urged against the protuberance **122**, either tongue **22** being stopped by the protrusion **13**, and either front fastening member **25** being securely engaged with both the stop member **14** and protuberance **122** after passing the stop member **14**.

2. The SIM card connector of claim **1**, wherein the fastening member **25** is a gable.

3. The SIM card connector of claim **1**, wherein the shoulder **121** is a ramp.

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